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List of Acronyms

ASPIRED	Advanced Science and Partnerships for Integrated Resource Development
ATTC	Aquaculture Technology Transfer Center
AAB	Ararat Artesian Basin
BMO	Basin Management Organization
BMP	Basin Management Plan
CADI	Computer Assisted Development, Inc.
CARD	Center for Agribusiness and Rural Development Foundation
CoP	Chief of Party
COR	Contracting Officer's Representative
DO	Development objective
DSS	Decision Support System
EA	Environmental Assessment
EC	European Commission
EE/RE	Energy Efficiency/Renewable Energy
EGO	Economic Growth Office
EIMC	Environmental Impact Monitoring Center
EMIC	Environmental Monitoring and Information Center SNCO
EMMP	Environmental Mitigation and Monitoring Plan
ERGIS	Environmental Research and GIS
ESS	Environmental Scoping Statement
EU	European Union
FAR	Fund for Armenian Relief
FTF	Farmer to Farmer Project
GIS	Geographic Information System
GOA	Government of Armenia
HMC	Hydrogeological Monitoring Center
ICARE	International Center for Agribusiness Research and Education
IR	Intermediate Result
ITF	Interagency Task Force
The Lab	U.S. Global Development Lab
MoA	Ministry of Agriculture
MNP	Ministry of Nature Protection
MoENR	Ministry of Energy and Natural Resources
MoU	Memorandum of Understanding
NGO	Non-Governmental Organization
PEER	Partnership for Enhanced Engagement and Research
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PIRS	Performance Indicator Reference Sheet
PMP	Performance Management Plan
PPR	Performance Plan and Report
PRP Project	Partnerships for Rural Development Project
PURE-Water	Participatory Utilization and Resource Efficiency of Water
SCADA	Supervisory Control and Data Acquisition
SEDF	Sustainable Energy Development Fund
SCWS	State Committee on Water Systems
SME DNC	Small and Medium Entrepreneurship Development National Center
SOW	Scope of Work
STTA	Short-Term Technical Assistance
SWCIS	State Water Cadaster Information System
TO	Task Order
WRMA	Water Resources Management Agency
WADI	Water and Development Indefinite Delivery/Indefinite Quantity Contract
USAID	United States Agency for International Development
USGS	United States Geological Survey

1. Executive Summary

This report describes the programmatic activities implemented by the Advanced Science and Partnerships for Integrated Resource Development (ASPIRED) Project during the third quarter of Year 3 of the project. It covers the period from April 1 through June 30, 2018. The report reviews progress and achievements in each of the project areas during the reporting period, as well as describes planned activities for the next quarter. The report also highlights challenges and actions taken to address these challenges.

1.2 ASPIRED Project Summary

On September 29, 2015, the United States Agency for International Development (USAID) awarded ME&A (formerly Mendez England & Associates) a contract to implement the ASPIRED Project under the Water and Development IDIQ (WADI). The purpose of the ASPIRED Project is to support sustainable water resource management and sustainable practices of water users in the Ararat Valley through the use of science, technology, innovation and partnership initiatives. The ultimate goal is to reduce the rate of groundwater extraction in the Ararat Valley to the sustainable levels.

To this end, the ASPIRED Project focuses several critical areas:

1. Water Resource Data
2. Technology
3. Regulatory framework/enforcement of laws
4. Coordination across stakeholders

The ASPIRED Project places a strong emphasis on building partnerships with the public and private sectors, research organizations and international donors to pilot innovative water and energy efficiency technologies, and to promote better water resource monitoring, planning and sustainable management.

1.3 Main Highlights from the Reporting Period

- Data component:
 - Finalized a conceptual model for the Ararat Valley groundwater resources. On June 6, ASPIRED presented the purpose of modeling, the major steps and the methodologies, the data sets/tools, and expected outcome to the specialists of the Environmental Monitoring and Information Center (EMIC).

- Installed the flow-meters and data loggers on 15 groundwater wells in the Interaqua, Alex-Grig, and Golden Fish (former Unifish) fisheries, in line with the technical approaches provided by Hybrid Telematica¹ team in their proposal.
- Presented land cover/land use classification results and the geodatabase to the stakeholders.
- Technology component:
 - Completed the major part of construction and installations works at Sayat-Nova water reuse project and conducted the training of beneficiaries on sustainable farming.
 - Selected the sub-contractor and started construction works at the Aquaculture Technology Transfer Center (ATTC).
- Legal component:
 - The work plan and establishment of the working group for the development of the methodology for assessment of self-purification capacity of rivers and establishment of requirements for protection of water resources in recreation zones of Armenia, including the enforcement mechanisms.
- Communication and Donor Coordination component:
 - Agreed upon terms of collaboration agreement with the Sustainable Energy Development Fund, to be signed on July 10.
 - Collaborated with the Center for Agribusiness and Rural Development Foundation (CARD) on the delivery of the sustainable farming training for the beneficiaries of Sayat-Nova water reuse project.

¹ ASPIRED subcontracted Hybrid Telematica for procurement and installation of the flow meters and data loggers on 20 groundwater abstraction wells in the selected 4 large fisheries in the Ararat Valley, which were selected and recommended to the ASPIRED Project by the MNP in February 2018.

2. Summary of Performance Indicators

Summary of performance indicators for the third quarter of FY 2018 (Year 3 of the project) is presented in the table below.

	Indicator	Planned/ Actual Target for Year 3	Quarter 3	Life of project (as of Q3/2018)	Notes: Descriptions/Comments/Assumptions
IR 1: Establish a comprehensive, user-friendly, open data system that is accessible to all stakeholders.					
Sub-IR 1.1: Ararat Valley Geocoded, real-time, publicly accessible data system that incorporates water resource, groundwater, and hydrological datasets from multiple stakeholders built and shared with the GOA					
Indicators					
1.1.1	Percent (of total) of datasets for the Ararat Valley publicly accessible	20/23	23	43	80% of all datasets available on Ararat Valley will be made public, which accounts for 100% of all the data that can be available to the public according to the Armenian legislation. During Y3, three sets of data were finalized and made available, including: <ul style="list-style-type: none"> - Data on Land cover/use classification of the Ararat Valley, - CN raster curve and datasets on precipitation/run-off generation for the Ararat Valley - Hydrogeological structure of the Ararat Valley
1.1.2	Percent (of total) wells mapped in the Ararat Valley.	N/A	N/A	100%	This indicator corresponds to the inventory of the wells, natural springs and fish farms in Ararat Valley, which the project team successfully completed during Year 1. The indicator dropped from reporting for the remainder of the project.
1.1.3	Number of stakeholders engaged in the data collection activities	5/3	3	12 ²	This target refers to the stakeholders engaged in the groundwater-related data collection activities in the Ararat Valley from different sectors – government, private, and public. The MNP nominated 4 fisheries (instead of planned 5) for installation of the automated online groundwater use monitoring systems – Alex Grig, Interaqua, Maxfish, and Golden Fish. As of June 2018, the ASPIRED installed the system in 3 fisheries. The date of system installation at

2. MNP with its subdivisions, PEER grantee, Institute of Water Problems, USGS, EU Water Initiatives Project, MOA, Metsamor power plant which are/were involved in the data collection process

					Maxfish is pending.
Sub-IR 1.2: An online tool for hydrogeological modelling and decision-support for the Ararat Valley that incorporates hydrologic, economic, energy, social equity and environmental data generated					
Indicators					
1.2.1	GIS-based decision support tools for Ararat Valley developed	1/0	0	0	ASPIRED will complete the customized Hydrological Model of the DSS for the Ararat Valley in Q4 of Year 3. The Groundwater Flow Model for the Ararat Valley will be completed in Year 4.
Sub-IR 1.3: A publicly accessible system that maximizes the use of open source technology and produces reports based on high-quality, real-time monitoring data created					
Indicators					
1.3.1	Number of fisheries with automatic data system installed	5/3	3	3	In April 2018, the project initially started installation of online groundwater use monitoring systems at four large fisheries of the Ararat Valley. By the end of Y3, ASPIRED completed the project in 3 fisheries. See comments for Indicator 1.1.3.
Sub-IR 1.4: Plan for decentralized, sustainable data collection methods to monitor groundwater resources and strengthened implementation capacities of partners developed in partnership with the Government of Armenia (GOA) and local stakeholders					
Indicators					
1.4.1	Percent (of total) coverage of the groundwater extraction points monitored	8/5	5	5	This indicator measures the percentage of the groundwater extraction wells monitored with the use of the online automated system installed by the ASPIRED Project versus the total number of the operational groundwater wells available in the fisheries 3. By July 2018, ASPIRED installed 15 groundwater monitoring systems, This indicator also includes 3 groundwater monitoring systems installed under the European Union's Water Initiative + Project. See comments under Indicator 1.1.3 for more details.
IR 2: Introduce locally appropriate, cost effective technologies to improve water resource management					
Sub-IR 2.1: Technologies developed, piloted, and evaluated at different-sized fish farms with the objective of improving water resources management					

3 During the latest inventory of the groundwater wells, natural springs and fish farms of the Ararat Valley, ASPIRED inventoried a total of 2807 wells in the Ararat Valley, of which 1795 were found to be operational. Out of 1795 functioning wells, 336 are reportedly located in the fisheries of Ararat and Armavir marzes.

Indicators					
2.1.1	Number of groundwater extraction reduction technologies piloted and evaluated	3/0	0	2 ⁴	This indicator refers to technologies introduced at fish farms or other water use points that lead to the reduction of the groundwater extraction by users. This indicator also provides information on annual water saved, measured in cubic meters.
2.1.2	Thousands of cubic meters of water saved annually in Ararat Valley	9000/1975	1025 ⁵	3550	This indicator measures the amount of water savings from the demonstration of innovative water saving technologies by the ASPIRED Project at fish farms and other water use points, as well as the implementation of water rehabilitation projects in the communities of the Ararat Artesian Basin affected by the shortage of groundwater resource (in collaboration with PURE Project). The data is cumulative and includes recurrent savings provided by completed water projects (Hayanist 1.1 mln, Sipanik 1.9 mln). ASPIRED initiated the Water Reuse Project in Sayat-Nova village and the ATTC, the data for which will be reported after their completion.
Sub-IR 2.2: Technologies with the objective of increasing energy efficiency and/or renewable energy generation of water users developed, piloted, and evaluated					
Indicators					
2.2.1	Number of energy efficiency and/or renewable energy (EE/RE) technologies piloted and evaluated	3/0	0	0	This indicator refers to water-use related EE/RE technologies to be piloted during the project implementation. The project will install renewable technologies (photovoltaic and biogas) at the ATTC. Data for this indication will be available after completion of the ATTC project.
2.2.2	Megawatt hour of energy saved annually	125/12	12	36	This indicator refers to the kilowatt-hour energy savings generated due to more efficient use of energy. Recurrent savings generated by completed projects are counted in the subsequent years. Quarterly data reported on the operation of Hayanist project.
2.2.3	Clean energy generated annually, MWh	63/0	0	0	This indicator refers to the clean energy generation capacity resulting from the introduction of RE technologies aimed at minimizing extraction of the groundwater. The data of this indicator depends on the implementation of EE/RE technologies, as tracked under Indicator 2.2.1
2.2.4	Gains in the reduction of GHG emissions as a result of USG assistance, in metric one	40.8/5.7	5.7	17.1 ⁶	GHG emissions reduction-related data will be calculated based on the kilowatt hour of savings resulting from application of energy saving technologies in metric tons/year. Results refer to the operation of Hayanist pumping station for the current period.

⁴ The data refers to the Water Reuse Project in Hayanist⁴ and the Well Sealing Project in Sipanik village

⁵ Savings generated by Sipanik and Hayanist for a quarter period.

⁶ Data refers to Hayanist project.

2.2.5	Number of people receiving improved service quality from an existing basic or safely managed water service as a result of USG assistance.	5700/0	0	340 ⁷ (200 women; 140 men)	Qualitative improvements ⁸ of the water resource resulting from the infrastructure projects implemented by ASPIRED ⁹ . The term “water users” refers to households, local farmers, and other groups benefitting from these improvements. (Gender disaggregated whenever possible). ASPIRED currently implements the Sayat-Nova Water Reuse Project. ASPIRED will report data relevant to this pilot project after its completion.
2.2.6	Number of water users experiencing improved efficiency of water resource use	8/0	0	3 ¹⁰	This indicator tracks improved efficient use of water resulting from the pilot projects implemented under the ASPIRED Project. Examples of such projects can potentially reduce water abstraction by fish farms due to new technologies installed. ASPIRED will report on the data on the ATTC, Sayat-Nova, and other pilot projects upon their completion.
Sub-IR 2.3: Based on the pilot process and available research, recommendations developed for successful water and energy technologies for policy-makers and stakeholders shared					
Indicators					
2.3.1	Number of successful technologies recommended and shared with the stakeholders and policy-makers	3/1 ¹¹	0	2	ASPIRED will pilot at least six technologies by the end of TO, with their evaluation and recommendations to be provided during Year 5 of the project. The data on ATTC and Sayat-Nova projects will be reported after its completion.
Sub-IR 2.4: Technology or method to permanently close illegal and/or abandoned wells, developed, piloted, and evaluated					
Indicators					
2.4.1	Number of piloted technologies to permanently close illegal or abandoned wells	2/0	0	1	ASPIRED planned to pilot at least two well optimization/sealing projects during Year 3. The project has submitted a letter of inquiry to MNP regarding recommended wells for closure and is waiting for a response. USAID approved the well optimization project in Sipanik, the data on which will be reported in September or October 2018 (depending on the completion of the project).
IR 3: Introduce new policies and regulations to improve integrated water resource management.					

⁷ The LOP data refers to the beneficiaries of the water reuse project in Hayanist (85 households, 340 people)

⁸ Pre and post-implementation water tests will be taken to detect the qualitative changes in water.

⁹ Initially, this indicator referred only to the drinking water supply projects. By the recommendation of USAID, the data will be taken from all water supply projects (both potable and irrigation water supply) which resulted in the improved service quality for the beneficiaries.

¹⁰ The results refer to Sipanik and Hayanist projects, including community and the fish-farm owner. Based on the results of Hayanist project, (a) the community avoided drilling of an additional well for irrigation needs; (b) the fishery became a more efficient water user by providing water to the community instead of dumping to the drainage water and gaining a possibility to use the existing pump for the recirculation of water, thus reducing its water abstraction from the groundwater well.

¹¹ Masis Dzuk fish-farm, piloted a degassing and aeration technology on his own expenses, with the consultation of the ASPIRED Project.

Sub-IR 3.1: Trainings to build groundwater monitoring capabilities, capacity strengthening, and knowledge of how to use equipment; and follow-up assessments to test knowledge on groundwater monitoring and analysis of the basin management organizations (BMOs) and relevant water management agency officials to improve enforcement.

Indicators

3.1.1	Number of trainings for building capacity of MNP in groundwater monitoring	1/2 ¹²	0	4	This indicator refers to trainings on enhanced up-to-date State Water Cadaster Information System (SWCIS) and Management Information System (MIS) for the Ararat Valley and on enhanced transparent water use permitting, control, and oversight systems and decision support tools.
3.1.2	Number of people educated on tools, approaches, and/or methods for water security, integrated water resource management, water source protection and sustainable water use as a result of USG assistance.	15/29 (24 men; 5 women)	10 (10 men)	77 (17 women and 60 men)	This indicator refers to trainings on enhanced up-to-date SWCIS and MIS for the Ararat Valley; enhanced transparent water use permitting, control and oversight systems; environmental compliance procedures and efficient water use trainings for the beneficiaries of the communities. This indicator is not cumulative and is reported on an annual basis. The Quarter 3 data refers to participants of the EMMP trainings for the Sayat-Nova and ATTC pilot projects.

Sub-IR 3.2: Rigorous, evidence-based analysis of optimal water fee levels completed, shared with engaged stakeholders and recommendations provided to the GOA

Indicators

3.2.1	Number of workshops and consultations with stakeholders to discuss water fee levels	N/A	N/A	9	The target for this indicator was met during Year 2 /Quarter 2; indicator dropped from reporting for the remainder of the project.
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Sub-IR 3.3: Water permitting monitoring and enforcement measures assessed and publicly available and recommendations, including development of regulations, provided to the GOA.

Indicators

3.3.1	Package of recommendations to address water permitting monitoring and enforcement measures provided to GoA	1/1	0	1	This indicator refers to the package of recommendations that the ASPIRED Project drafted and submitted to the GOA. Per Government request, ASPIRED submitted the expert opinion on program of measures in national Water code to USAID.
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IR: Ensure communications and coordination with stakeholders to avoid duplication of efforts

Sub:IR: 4.1 Systems-mapping to gain and apply knowledge of points of influence, incentives, and resources of stakeholders in water and the water-energy nexus completed and shared

¹² In December 2017, ASPIRED conducted a two-week GIS course for the WRMA and EMIC staff. In January 2018, the groundwater modeling course for the specialists of MNP and academic centers.

Indicators					
4.1.1	Number of international and local organizations participating in the system mapping activities	1/1	0	24	This indicator refers to newly identified stakeholders and points of influence in water and water-energy nexus for the ASPIRED Project.
Sub-IR 4.2: A transformative partnerships model to respond to needs for research, pilots, analysis and other coordinated efforts that is demand-driven, flexible, and has a plan for financial sustainability created					
Indicators					
4.2.1	Percent of total funding leveraged from stakeholders for water resources management activities.	40/39.3	39.3	34 ¹³	Total in-kind and financial contribution by ASPIRED partners versus the total contribution of the Project. Targets are not cumulative and refer to a particular year. The information for Y3 Q3 refers to the Sayat-Nova Project.
4.2.2	Number of partnerships made by ASPIRED with other organizations	4/5	2	11	This indicator refers to partnerships and collaborations with other donors, public and private sector organizations for the implementation of joint projects and/or other initiatives contributing to the accomplishment of ASPIRED objectives. Results include collaboration with the Center for Agribusiness and Rural Development (CARD) Foundation on the farmer training in Sayat-Nova, as well as with Armavir Farmer LLC for the ATTC Project.
1. Portfolio-level indicators					

¹³ The reported figure is taken from the actual cost-share of partners (Coca-Cola HBC, ERGIS and Hayanist community –for Hayanist project and VALML LLC for Sipanik) in the implementation of the irrigation rehabilitation projects. Based on updated results from Year 2, the percentage of funds committed by partners decreased from 34% (as of August/September 2017) to 33% due to the overall increase of ASPIRED contributions to the pilot projects. ASPIRED was the major donor of Sipanik project.

5.1	Percent of population living in targeted areas with improved water management	19/0	0	4.1 ¹⁴ (women – 2.1%; men - 2%)	The geographical target area is the Ararat Artesian Basin (AAB), a territory of 13,075 hectares with a population of 58,373 people (28,392 men; 30,345 women).
5.2	Number of key implementation steps taken to improve water management in the Ararat Valley	2/1 ¹⁵	0	5 ¹⁶	Policy, analysis, and other activities targeted towards improvement of water data-related activities, including training and pilot projects.
5.3	Number of private sector firms that have improved management practices or technologies, as a result of USG assistance	6/4 ¹⁷	3	5	This indicator refers to (a) the number of fisheries with automated groundwater use monitoring systems installed; (b) fisheries which have adopted innovative water or energy efficiency (including renewable) technologies. Q3 data refers to three fisheries equipped with online monitoring systems, as of June 2018.
5.4	Number of innovations supported through USG assistance.	3/1	1	2 ¹⁸	This indicator refers to innovative technologies, management/monitoring tools or practices introduced by the ASPIRED Project in fish farms, at water use points and/or communities of Ararat Valley which contribute to the reduction of the groundwater use. Quarter 3 data refers to ATTC project.
5.5	Number of innovations supported through USG assistance with demonstrated uptake by private and/or public sector firms	1/2	1	2	This indicator refers to the uptake/replication by the public and/or private sectors of projects, technologies, innovations and/or practices introduced by the ASPIRED Project at fish farms, water use points and/or communities of the Ararat Valley. Year 3 results refer to the replication of the water reuse project in Hovtashat community (with assistance from ERGIS NGO).

14 The LOP results refer to the population size of Sipanik & Hayanist communities versus the total size of the population in the AAB.

15 Y3 results: (1) ASPIRED completed the customized Hydrological Model of the DSS for the Ararat Valley; (2) installed online monitoring systems in fish-farms.

16 (1) The inventory of groundwater wells and springs was completed in September 2016. (2) USAID presented two reports to the GOA - Achieving Sustainable Groundwater Use in the Ararat Valley: the Role of the Fisheries Sector and the Final Report on the Inventory of Groundwater Wells, Natural Springs and Fisheries of the Ararat Valley; (3) ASPIRED was involved into the Interagency Task-Force established by the Prime-Minister's assignment in January-February 2017. In May 2017, the Armenian Prime-Minister Karen Karapetyan approved the Program of Measures for Efficient Management of the Groundwater Resources of Ararat Valley. Developed with the expertise and data support of the ASPIRED Project, the Program envisages an array of regulatory, legislative, institutional and technical measures for a more rational use of water in the Ararat Valley for different purposes such as fish farming, irrigation, drinking, and drainage system; (4) ASPIRED launched implementation of pilot projects aimed at improving water management on the grassroots level by the communities, fish-farmers: irrigation improvement project in Hayanist (launched in May 2017), well conservation project in Sipanik. (5) installation of the automated online groundwater use monitoring system in the fisheries of the Ararat Valley,

17 The data includes Masis Dzuk and 3 fish-farms with online monitoring systems.

18 The LOP data refers to the practice of the secondary use of that outlet water from fisheries for irrigation purposes (Hayanist) which has never been practiced at a community scale.

3. Program Implementation

Water Resource Data

State Water Cadaster Information System (SWCIS) Enhancement

During the reporting period, ASPIRED continued cooperation with the partners in improving the data management system of the MNP and its Water Resources Management Agency (WRMA). In May, per the recommendation of the Minister of Nature Protection, the ASPIRED technical team met with Yuri Poghosyan, the Project assistant of the EU-funded project on Shared Environmental Information System (SEIS). The purpose of the meeting was to discuss the format and compatibility of the data warehouses being developed within the framework of the SEIS (integrated environmental database) and ASPIRED (SWCIS). ASPIRED is currently enhancing the SWCIS data warehouse, which is planned to become one of the SEIS components, and can serve as a model for other database components of the SEIS as a well-designed warehouse.

In June, the ASPIRED team also met with the EU Water Plus Initiative Project counterparts to coordinate activities and the progress of both projects on improvement of the SWCIS data warehouse and databases in individual agencies.

As of now, dates to test and debug the pre-programmed SWCIS data warehouse databases are pending, due to delays in the operationalization of the MNP's new server provided by the Coca-Cola Hellenic Bottling Company (Coca-Cola HBC) in February 2018. By the end of the reporting period, ASPIRED reached out to MNP with both written and verbal inquiries regarding this delay and is waiting for MNP's response on this matter.

Decision Support Tools

DSS: The ASPIRED team completed reprogramming of the precipitation-runoff component under the Hydrological Model of the DSS, using land cover/land use classification results. The ASPIRED team tested the model for the Ararat Valley, using the datasets on multi-year average values of precipitation and curve number (CN), as well as annual raster images for 2015 and 2016. Values of the natural surface flow were generated and tested. Values of the deep groundwater flow were also generated, which will be finalized during the next quarter. The project team plans to use the tested values for surface and deep flows in the calculation of water balance in the Ararat Valley during the next reporting period.

ASPIRED continued the improvement of the surface water quality assessment component of the DSS. The reprogramming of the tool stems from the needs of the main stakeholders to visualize the river sections within the Ararat Valley, based on the water quality analysis results and their suitability for use for drinking and irrigation purposes. ASPIRED conducted the assessment using the norms for drinking water adopted by the Armenian legislation, and FAO norms established for irrigation water. ASPIRED tested the tool for the selected river stretches in the Ararat Valley catchment area.

ASPIRED successfully completed the programming of the automated simplified version of the Hydrological Model of the DSS for the decision-makers and initiated the next step of the testing and debugging process.

Groundwater modeling tools: During the quarter reported, the ASPIRED team finalized a conceptual model for the Ararat Valley groundwater resources. The project team shared the conceptual model with MNP representatives during a discussion on the conceptual approaches of the groundwater modeling. On June 6, the ASPIRED team presented to EMIC specialists the purpose of modeling, major steps involved, the methodologies, data sets and tools applied, and expected outcomes. The experts discussed the key



ASPIRED team discusses hydrogeological modeling with EMIC specialists.

technical aspects to be considered in modeling of the Ararat artesian basin. Given the size and the geological complexity of the Ararat Valley's Artesian Basin, the EMIC specialists agreed to work as a team in the accomplishment of this challenging task..

During the reporting period, the ASPIRED team continued creating the two-dimensional cross sections of the Ararat Valley and generating the three-dimensional hydrogeological structure of the Ararat Valley, using the ArcHydro Groundwater (AHGW) software. The team consulted with Aquaveo, a U.S. based company, on how to refine the attained results and generate of the numerical values of the volumes of the hydrogeological layers of the Ararat artesian basin, including water-bearing layers.

Remote Sensing Technologies for Data Analysis

The ASPIRED Project finalized the main outcomes of the remote sensing for the Ararat Valley, using high-resolution satellite imagery. On June 19, the ASPIRED data team presented the results to nearly 25 representatives of key stakeholders, including the Ministries of Nature Protection, Agriculture (MOA), Energy Infrastructures and Natural resources, AUA, as well as ICARE/ATC and USAID. During the presentation, ASPIRED provided all participants with the electronic version of the GIS (Geographic Information System) map on land cover/land use classification and geodatabase. Printed copies of the map in A-1 format were provided to each of the participating agencies/institutions.

Introduction of the automated online system for groundwater use monitoring

Hybrid Telematica¹⁹, a local service provider for this task, installed the flow-meters and data loggers on 15 groundwater wells in the Interaqua, Alex-Grig, and Golden Fish (formerly Unifish) fisheries, based on the technical approaches provided by the Hybrid Telematica team in its proposal. The local subcontractor is currently testing and calibrating the operation of the flow meters and data loggers in these 3 fisheries.

ASPIRED and Subcontractor specialists worked closely on identifying the technical solutions for issues and concerns since the start of the installation process. ASPIRED specialists and subcontractor representatives conducted periodic site visits to monitor the installation works.



ASPIRED and Hybrid Telematica specialists discuss technical solutions at the sites.

Regarding the fourth fishery (MaxFish), Hybrid Telematica was not able to install the system in the fishery as planned, as the owner of the fishery hadn't given ASPIRED Subcontractor's access. Despite the original notification from the MNP on this pilot activity and the Ministry's verbal agreements reached with the manager of the MaxFish fishery in April and May, this issue remained unresolved. Since this is beyond managerial control of the ASPIRED Project and its Subcontractor, ASPIRED requested USAID assistance. In a response to the ASPIRED Project's notification to USAID and MNP that Hybrid Telematica's subcontract ends on June 30, 2018, the MNP requested that USAID and ASPIRED extend the duration of this activity until the Ministry reaches a solution with MaxFish. ASPIRED complied with the request and extended the duration of the Hybrid Telematica Subcontract to September 20, 2018.

ASPIRED team drafted a scope of work for development of the SCADA software for online groundwater use monitoring in the Ararat Valley and submitted it to the MNP for review and comments in early April. In May, following the Project's written and verbal reminders to the MNP

¹⁹ ASPIRED's subcontracted the company for procurement and installation of the flow meters and data loggers on 20 groundwater abstraction wells in the selected 4 large fisheries in the Ararat Valley, which were selected and recommended to the ASPIRED Project by the MNP in February 2018.

for receiving their feedback on the draft SOW, the Ministry informed ASPIRED verbally that they expect this software to be donated by another company, and the financial resources planned by the ASPIRED for the software development could be directed to other needs. During a meeting between the Minister of Nature Protection and Director of USAID-Armenia's Sustainable Development Office on June 18 the Ministry mentioned that ASPIRED Project is expected to provide the SCADA software to the Ministry. On July 2, ASPIRED received a letter from the Deputy Minister of Nature Protection on this regard (the letter is dated May 25, 2018). The ASPIRED Team will clarify this issue with the MNP and USAID.

Extending the national reference groundwater monitoring network in the Ararat Valley:

ASPIRED collaborated with the EMIC on the implementation of the main directions towards creation of more integrated quantitative and qualitative monitoring and assessment of groundwater resources in the Ararat Valley. Activities with EMIC during the reporting period included extension of the national reference groundwater monitoring network in the Ararat Valley and support to the EMIC in enhancing the hardware and software, and capacities of the personnel for data collection and analysis.

In May, the EMIC provided the ASPIRED Project with the electronic copies of agreements signed between the EMIC and the owners of the groundwater wells which were proposed by the EMIC for inclusion into the extended monitoring network. EMIC assigned Harutyun Yeremyan as EMIC's point of contact to work with the ASPIRED team on the needs assessment for rehabilitation of the proposed 10 groundwater monitoring wells. ASPIRED and EMIC representatives conducted joint site-visits in June to estimate the condition of the wells, types and volumes of the works to be done for refurbishing the wells for the monitoring purposes, and owner's concurrence on the planned activities. On June 28, the ASPIRED team met with the technical team of the EMIC to discuss and finalize the works for rehabilitation of the selected 10 groundwater wells. EMIC proposed skipping the well in the Talvorik community for the following reasons: its utilization for drinking purposes (monitoring the water level is not allowed from the pollution prevention perspective); the lack of a WUP for the well; and the existence of other wells in the same area which will provide representative data. The proposed works were discussed with Simon Papyan, EMIC director, who gave his concurrence for refurbishing nine wells as recommended by the specialists.

ASPIRED and EMIC specialists finalized the list of the required equipment for enhancing the EMIC's capacities in monitoring of groundwater resources, including the technical specifications. ASPIRED team worked on acquiring the price quotations from the specialized vendors for the acquisition of the specified equipment.

Aquaculture Technology Transfer Center (ATTC)

During the reporting period, ASPIRED moved forward with the construction of the ATTC facilities after fully-executing a service agreement with Ashkar LLC for implementation of construction works associated with ATTC. Currently, the sub-contractor in collaboration with the project partner Armavir Farmer LLC has nearly completed construction of the main infrastructures. By June 30, 2018, Ashkar LLC and Armavir Farmer LLC completed the following activities under this pilot project:

- Initial site preparation, inspection of existing structures and removal of existing debris;
- Restructuring of existing ponds;
- Construction of the bio-treatment pond;
- Construction of a reinforced concrete cover over the crayfish ponds;
- Preparation of the sludge drying pad;
- Strengthening of the walls
- Laying of the main piping

ASPIRED contracted the Ayr Design LLC to supervise compliance with the existing construction blueprints. Both the ASPIRED engineer and environmental officer regularly visited the site to monitor the construction process and compliance to the EMMP requirements regarding the safety of construction process and disposal of wastes.

Water Reuse Project in Sayat-Nova

In the past quarter, ASPIRED successfully completed 90% of planned activities on this project as planned in the project concept and agreed upon between the project partners, based on the Memorandum of Collaboration signed on December 2017. In the reporting period, ASPIRED completed construction of the pumping station, including installation of pipes and other equipment. The village did its part of the work related to installation of the transformer substation and digging of the trenches for the pipes, whereas other project partners supplied pipes in full quantity. By the end of the reporting period, the irrigation pipeline with all its outlet hoses and valves was in place.

The village is still negotiating with the Electric Networks of Armenia on the connection of the transformer sub-station to the grid to ensure the autonomous power supply of the pumping station. During the next reporting period, the village is expected to complete the construction of a short channel connecting the intake tank of the pumping station with the fish pond.

Design of New Projects

ASPIRED is currently working with USAID's Participatory Utilization and Resource Efficiency of Water (PURE) Project on identifying and launching water projects in the select communities of Ararat Valley . In April, ASPIRED recruited an engineer to work specifically on PURE water projects.

After conducting several site visits and clarifying technical details, the engineers prepared the initial concepts for four potential sites for water (two drinking and two irrigation) projects: Aratashen, Yeghegnut, Khachpar and Vedi projects. The ASPIRED decided to start with the projects in Aratashen and Yeghegnut first.

On May 23-24, ASPIRED and PURE Project teams met with the mayors of Aratashen and Yeghegnut communities to discuss the projects and to confirm their commitments towards the cost-share sizes and the amount of work to be fulfilled by the villages. The PURE Project's environmental officer assisted relevant community representatives with the water user permit application process and submitted the final application packages to the WRMA. USAID approved implementation of the projects. The ASPIRED project will start planned works in July.



Left to right: construction of the ATTC premises and installation of irrigation pipes in Sayat-Nova village.

Water Regulation and Enforcement

The main objective of this component under the ASPIRED Project is to assist the MNP in the development of the methodology for assessment of self-purification capacity of rivers, including the enforcement mechanisms, and establishment of requirements for protection of water resources in recreation zones of Armenia. Following discussions with the Minister of Nature Protection on April 6, 2018, the MNP designated Lilit Ahrhanyan, the head of the Policy of Environmental Impact Assessment and Water Resource Protection Division, to be MNP's point of contact for this initiative. The Ministry of Agriculture (MOA) nominated David Mejlumyan, the Head of Melioration Division of Land Use, as the point of contact.

The ASPIRED and the MNP will form the working group consisting of field experts and government representatives to work on the assignment. By the end of the reporting period, ASPIRED drafted the work plan of activities and the terms of reference for the experts, as well as issued announcements for the consultancy services of a hydrologist and a legal expert. ASPIRED plans to finalize the list of working group representatives by the beginning of the next quarter, while activities will continue through Year 4. Based on the work plan schedule agreed upon between the ASPIRED and the MNP, the establishment of requirements for the protection of water resources in recreation zones will be

completed in September, and the second assignment related to the assessment of self-purification capacity of rivers and the enforcement mechanisms will start in October 2018.

Following the written request of the MNP to the USAID's Mission Director, ASPIRED followed up with the outcomes of the expert assessment of the amendments to the Program of Measures of the National Water Program provided by the ASPIRED team.. The e-draft of this document is available on the web-portal (<https://www.e-draft.am/projects/914/about>) and is currently under the MNP's review.

Donor Coordination and Communications

Partnership Initiatives. Over the past quarter, the ASPIRED team held a series of meetings with existing and potential partners. ASPIRED initiated the new partnership process with the Sustainable Energy Development Fund (SEDF) to discuss collaboration opportunities for the implementation of Vedi project. By the end of the reporting period, both ASPIRED and the SEDF were reviewing English and Armenian drafts of a memorandum of collaboration specifying joint activities. During the next reporting period, ASPIRED and SEDF plan to finalize and fully execute this agreement.

On June 6, ASPIRED met with the representatives of CARD Credit and CARD Agroservice to discuss collaboration opportunities, particularly a presentation of the CARD products and services during the training of Sayat-Nova farmers on sustainable agriculture to be conducted by the ASPIRED in July.

On June 12, ASPIRED team met with the newly appointed Governor, Deputy Governor, and Head of International Collaboration Department of Ararat marz. The objective of the meeting was to present the goals and activities of the ASPIRED Project to the newly appointed regional authorities and solicit their support. The discussion focused on the shortage of drinking and irrigation water faced by the communities of Ararat region. ASPIRED presented the fish farm water reuse projects for irrigation purposes and other infrastructure rehabilitation projects to be implemented in the communities. The governor was aware of the pilot project in Sayat-Nova village and was interested in pursuing similar projects in the communities

The partners for the Sayat-Nova Water Reuse Project – Small and Medium Entrepreneurship National Development Center and the Fund for Armenian Relief, purchased the water supply pipes as set out in the partnership agreement. As the next phase, ASPIRED team will start planning the farmer training and the project opening event in the community.

The ASPIRED team held a series of coordination meetings with the PURE team to discuss the scheduling and implementation of pilot projects, namely the preparation of the environmental documentation for the project and assistance in obtaining the water use permits by the villages. It was also emphasized that the communities should confirm their commitment to provide the cost-share for the projects.

During Quarter 3, the ASPIRED team participated in a number of activities organized by the PURE Project team, including an public outreach event in Vedi, the work planning retreat of the Project, the small grants review committee, and the meeting of the public advocacy informal network.

Communications and Outreach. ASPIRED uses its Facebook page and web site for posting project news, tender announcements, and other updates on the ASPIRED Project. During the reporting period, ASPIRED posted photos and news updates on Sayat-Nova Water Reuse Project, the ATTC, the installation of data loggers and flow meters in the Ararat Valley, and other activities. The [section on pilot projects](#) now includes also information on the installation of flow-meters and data-loggers in the fish-farms. The write-up of the project events also shared with the ME&A home office and USAID.

To raise public awareness on efficient use of water – particularly the secondary use of the outlet water from fisheries – the ASPIRED team prepared the leaflet on the suitability of the fish farm water for irrigation purposes and the results of organoleptic analysis of the crops, with Hayanist village featured as a case example on the leaflet. ASPIRED disseminated the leaflets among the potential beneficiaries and points of service, including to CARD’s agricultural support center in Darakert village.

4. General Administrative Issues

On April 27, Khosrov Harutyunyan resumed his duties as the ASPIRED Project’s Policy Coordinator. On June 21, the ASPIRED Project posted an announcement for short-term experts in hydrology/hydromorphology and water legislation. ASPIRED will complete the recruitment process during the next reporting period.

Over the reporting period, ASPIRED contracted the following three local service providers for pilot project implementation:

- Armplast LLC for supply and installation of water pipes in Sayat-Nova water reuse project;
- Ashkar LLC for the construction of the facilities of the ATTC; and
- Ayr Design LLC for the on-side designer supervision over the ATTC construction.

The contract with Hybrid Telematica expired as of June 30, 2018. By the request of the MNP, the ASPIRED team extended the contract to September 20, 2018 to allow the contractor to complete installation of the flow meters and data loggers on the remaining portion of groundwater wells, depending on the installation status for MaxFish Farm.

On June 27, ME&A Headquarters conducted the second procurement training for ASPIRED team. This session focused on USAID’s competition requirements and the relevant clauses under the Federal Acquisition Regulation (FAR) Part 6 – Competition Requirements.

5. Environmental Compliance

In April, the ASPIRED team conducted an environmental and social safeguards training for the personnel of the Ashkar LLC and Armavir Farmer LLC on the environmental and safety measures to be implemented during construction of the ATTC. The ASPIRED Project's environmental specialist made regular monitoring visits to the ATTC site to check the Subcontractor's activities compliance with the requirements of the Environmental Mitigation and Monitoring Plan (EMMP).

The team also monitored EMMP compliance at other project sites, namely compliance of the irrigation infrastructure improvement works with the requirements of environmental documentation at Sayat-Nova project and works for the installation of flow meters and data loggers at fish farms.

Observations made during the monitoring visits and further instructions to the ASPIRED Subcontractors and other implementing parties were documented in the Field observations checklists.

In this past period, ASPIRED checked the quality of water at the intake point of the Hayanist irrigation system as part of the pilot project's post-implementation assessment. ASPIRED analyzed about 45 parameters and results show no major deviations compared to the results from water quality checks in 2017. The water remains suitable for irrigation purposes, following the norms defined by the FAO for irrigation water.

ASPIRED's basin management planning/environmental specialist collaborated with the PURE Project's environmental expert of on assessing the baseline environmental conditions and developing the packages of environmental documentation for drinking water supply projects in the Yeghegnut and Aratashen communities. ASPIRED and PURE representatives provided the heads of the partner communities consultations on the process and procedures of issuance of water use permits from the MNP.

2. Existing Problems or Issues

The political developments in Armenia and transition to a new Government has caused delays in project implementation as major activities of the Project, specifically those of the data component, were contingent upon decisions of the Ministry of Nature Protection.

As mentioned earlier, ASPIRED Project suspended the start of the two water projects in the communities of Ararat Valley due to the need to obtain water use permits in the communities for using groundwater wells for drinking purposes. Since the water permitting process takes time and effort, ASPIRED and PURE projects, with concurrence from USAID, decided that the PURE team would provide the necessary guidance and assistance to the communities to obtain the water use permits from the MNP, while USAID would approve the concept for implementation as soon as the legal process is underway.

The Data team also faced delays in implementing its planned activities on: (a) enhancing of the SWCIS Data Warehouse; (b) completing installation of the flow meters and data loggers on the 5 groundwater abstraction wells; and (c) testing of the automated, online groundwater use monitoring system.

To address the above delays, ASPIRED plans to discuss the following with MNP:

- Upon installation of the server (provided by Coca-Cola HBC in February 2018), the ASPIRED team will be able to install the programmed databases of the SWCIS for piloting and debugging;
- The need to provide authorization and specific task to the WRMA technical personnel on populating the draft SWCIS Data Warehouse with data to allow the ASPIRED team to conduct testing and debugging of the programmed databases and work with the WRMA on the next steps of the SWCIS Data Warehouse improvement;
- If no agreement is reached regarding providing site access for the Hybrid Telematica personnel to install the flow meters and data loggers for Maxfish Company, ASPIRED and MNP will need to discuss other possible solutions for the remaining set of five flow meters and data loggers.
- Provide the final written feedback on the need for procuring the SCADA system software. If MNP determines that ASPIRED's assistance is no longer needed, as it may be donated by other organization, the ASPIRED team need to test the installed flow meters and data loggers with the donated software, which are the components of the automated online groundwater use monitoring system.

These delays affect the Project's ability to meet performance indicators defined for this fiscal year. Furthermore, it may impact the overall performance of the ASPIRED Project activities on improvement of Water Resource Data. Implementation of the delayed activities during Years 4 and 5 may affect implementation of other challenging tasks, such as groundwater modeling and decision support tools.

7. Planned Activities for the Next Quarter

7.1 Data

- Installation of the draft version of the SWCIS data warehouse operationalization of the MNP's new server; testing and debugging of the programmed databases, programming of the query and reporting based on the forms developed by the WRMA, after the WRMA personnel inputs the data into the SWCIS data warehouse.
- Finalizing Hydrological Model of the DSS, including the technical module for advanced users and automated module for decision-makers. The following tasks will be fully performed using DSS: (1) calculation of the water balance for 6 river basins of the Ararat Valley catchment

area for the years 2015 and 2016; (2) calculation of the water balance for the Ararat Valley for the years 2015 and 2016; and (3) generation of the water balance for the Ararat Valley with a one-button click under the automated module for decision-makers.

- Preparation of a project report on methodology and calculated values of natural flow and hydrological balance of the Ararat Valley.
- Testing and debugging of the enhanced surface water quality assessment component of the DSS.
- Training program for the technical staff of WRMA and EMIC, representatives of academia on DSS data organization and customization of the Hydrological Model of the DSS for the Akhuryan, Metsamor, Hrazdan, Vedi and Azat river basins.
- Development of the three-dimensional model of the Ararat Valley aquifers for the nine main hydrogeological units, including generation of 3D-volumes for each unit using the AHGW Tools.
- Project report on digital hydrogeological map of the Ararat Valley, three-dimensional structure of the Ararat Valley aquifers and pilot three-dimensional numeric model of the Ararat Valley aquifers.
- Pending MNP's agreement with the MaxFish Company, installation and testing of groundwater flow meters and data loggers for automated groundwater use monitoring system on the remaining five groundwater abstraction wells. If no agreement reached between the MNP and MaxFish, finalizing the mutually accepted option of handing over 20 sets of the flow meters and data loggers to the MNP.
- Pending MNP's written feedback on the SCADA software, procurement of services for the SCADA software design for the automated groundwater use monitoring system.
- Rehabilitation of nine groundwater wells in the Ararat Valley aimed at extending the national reference groundwater monitoring network.
- Procurement of equipment for enhancing the EMIC's capacities in qualitative and quantitative monitoring of groundwater resources, as planned for the Year 3.

7.2 Pilot Technologies

- Completion of the Sayat-Nova water reuse/irrigation project and testing of the irrigation system;
- Completion of the main construction work under the ATTC project;
- Procurement and installation of pumping equipment (pumps and controls) under the ATTC project;
- Finalizing the project concepts and expenditure estimates for two PURE projects: Vedi and Khachpar, and submitting them to USAID for approval;
- Preparation of the Sipanik well optimization project concept and submission to the USAID for approval;
- Starting the implementation of the Sipanik well optimization project upon USAID approval;
- Selection of a design contractor and starting the engineering design work under Yeghegnut

and Aratashen projects.

7.3. Legal and Policy Issues

- Establishment of a working group for defining the requirements for protection of water resources in recreation zones.
- Preparation of a schedule for the work group meetings and coordination with the experts and focal persons from the ministries.
- Regular meetings to discuss the technical and legal aspects of establishment of requirements for protection of water resources in recreation zones.
- Compilation of inputs from the work group members and sharing with the ASPIRED project team and ministries for comments and recommendations.
- Finalization of experts' inputs based on the comments and recommendations provided by the ASPIRED team and ministries.
- Drafting of a legal act on establishment of requirements for protection of water resources in recreation zones and submission to the GoA.
- Defining the areas of collaboration with PURE Water Project based on the latter's scope of activities to be finalized with the MNP.

7.4 Performance Management, Communication and Donor Coordination

- Signing of the memorandum of cooperation with the SEDF and follow up on joint activities.
- Conducting the community event in Sayat-Nova village, coordinating the preparations and involvement of other project partners and USAID, follow-up activities.
- As part of the team, conducting periodic monitoring visits to the project sites.
- Preparation of outreach materials on the project, fact sheets on new projects,
- Updating of project web site and Facebook pages,
- Follow-up on the PMP updates and prepare weekly highlights, monthly reports.
- Preparation of the summary of the PMP indicators for Year 3 and projections for the remaining project period.

7.5 Environmental Compliance

- Planning and delivering the health and environmental safety training programs for the project implementing partners for the drinking water supply improvement Projects in the Yeghegnut and Aratashen communities.
- Preparation and delivery of a training program on sustainable farming practices for the beneficiaries of the Sayat-Nova community.
- Regular monitoring of the ongoing pilot project activities in Sayat-Nova and Metsamor communities, and fisheries where installation of flow meters and data loggers is still in progress.

7.6 Project Management

- Preparation and approval of the ASPIRED Project's Work Plan for Year 4.

- Conducting financial management of the program.
- Management of procurement contracts.
- Follow-up on the implementation of the contractual commitments by the sub-contractors.
- Pending negotiations with the MNP, notice for the procurement of services for development of SCADA software for the automated groundwater use monitoring system. Selecting the local company to implement the assignment.
- Conducting a procurement of services for rehabilitating 10 groundwater wells in the Ararat Valley aimed at extending the national reference groundwater monitoring network.